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ABSTRACT

A study examined the interrelationship among print-related skills developed prior to formal reading instruction and social class differences in these skills in 33 middle-class and working-class children attending one of two high quality, reading-oriented kindergarten classes. Two hypotheses were generated: (1) that correlations would emerge among measures reflecting grasp of sound-symbol correspondence, phonemic awareness, how print language functions, and decontextualized language ability; and (2) that social class differences would be a factor for measures of decontextualized language and grasp of sound-symbol correspondences, but not for measures of abilities focused on in the kindergarten, such as print concepts and general understanding of how books function. Subjects, assessed as low socioeconomic status (SES) or high SES on the basis of their parents' employment status, were tested in three to four sessions of 15 to 20 minutes each. The results indicated that phonemic awareness, print decoding, print production, and literacy interrelate positively and significantly, but have generally low or negative correlations with the oral language composites. These results suggest that preschool reading readiness may include many different abilities, however highly related to one another. Gender had no significant main effect, but middle-class subjects scored significantly higher on all the prereading composite scores than did working-class subjects, suggesting that attendance at high quality nursery/kindergarten classes was not sufficient to equalize the skills of the two social groups. (A 10-page list of references and tables of data are included, and coding criteria for picture descriptions and of noun definitions are appended.) (HTH)

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Interrelationships Among Prereading and Oral Language Skills in Kindergartners from Two Social Classes

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Running Head: Prereading and Oral Language Skills

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Abstract

Thirty-three kindergartners from two social classes were tested on an array of prereading and oral language skills. Prereading test results were clustered into composite scores reflecting skill interpreting environmental print, understanding how print functions, producing and decoding print, isolating phonemes, and comprehending stories. Several decontextualized language skills were assessed with a picture description task and a word definition task. Prereading skills were found to be highly intercorrelated and to relate to the ability to provide decontextualized definitions for words. Oral language measures of decontextualized skill correlated within task, but not across tasks. Social class differences were found for the prereading measures and for those oral language measures that correlated with the prereading measures. Social class differences were not found on measures of ability to provide communicatively adequate definitions or for receptive vocabulary.

Educators have long known that children arrive at school with different levels of 'readiness' to learn to read. Even beginning kindergartners have many skills that have been seen as relevant to their later accomplishments as readers. Perhaps most obvious, they often have some specifically print-related skills, such as recognizing letters, writing their own names, reading familiar signs and logos, and the such. In addition, they have more generally 'literate' skills, such as understanding story structure, knowing how to use books, knowing that text can be used to convey meaning, and understanding many of the conventions of 'essayist literacy'. Young children have metaphonemic skills which some have claimed are prerequisite to reading--sound segmentation skills displayed in rhyming tasks, in creative spelling, and in word play. Finally, they may also have oral language skills that relate to literacy: large vocabulary, understanding of complex syntax, and understanding of some of the linguistic devices that are heavily exploited in text.

When looking for explanations for the failure to learn to read of some children, it is natural to implicate individual or group differences in factors such as those identified above, since they are presumed to be either early forms of reading or else prerequisites to reading. However, such explanations are premature for a number of reasons: 1) we do not yet know the nature of the interrelationships among these factors. It is possible that they are, in fact, all highly interrelated, or alternately that they constitute truly separate components of 'prereading' skill. 2)

without information about the pattern of relationships among these factors, it is difficult to pursue the question of their relationship to true reading. One or another of the component skills may be facilitatory of reading development, or even prerequisite to reading development. But if all are highly intercorrelated, it is very difficult to disentangle which one has a true predictive relationship to reading. Furthermore, it is of course possible that none of these 'prereading' skills is truly related to reading at all, but that they happen to correlate with some other factor that does predict reading achievement.

It was our purpose in the study presented here to examine the interrelationship among the skills identified above as hypothesized 'prereading' skills, and to look at social class differences in these skills in a group of children attending high quality, reading-oriented kindergarten classes. We hope to be able to clarify the relationship among the skills as a first step in developing theory and devising research to explicate how these skills relate to the later development of true reading skills.

Literature Review

In the past decade it has become increasingly apparent that, long before they enter school, children are developing abilities and acquiring information that will help them learn to read and write. Anthropologists (Heath, 1983; Schieffelin & Cochran-Smith, 1984; Scollon & Scollon, 1979, 1981; Taylor, 1983) and psychologists (Harste, Woodward & Burke, 1984; Snow & Ninio, 1986) have argued that competence with print can be traced to cultural factors that relate to patterns of parent-child interaction in the

home. Developmental psychologists have identified 'emergent literacy abilities' in preschool children that seem likely to be related to later skills in true reading and writing (e.g., Clay, 1979; Ferreiro & Teberosky, 1982; Sulzby, 1982, 1983, 1985, 1986). Snow (1983), on the other hand, has hypothesized that the major predictor of school reading is, not preschool skill in print or literacy domains, but skills with decontextualized oral language use.

Despite the interest in the origins of literate ability, only recently has a theory of early reading acquisition begun to emerge. Four general points regarding the development of literacy-related abilities prior to formal instruction can be made: 1) there is development from use of contextual information and wholistic characteristics of print to attention to discrete letters when reading, (Ehri & Wilce, in press; Mason, 1980, 1984; Masonheimer, Drum & Ehri, in press, Ferreiro & Teberosky, 1982), 2) there is development in grasp of concepts needed for thinking and talking about print (Bissex, 1980; Clay, 1979; Ferreiro & Teberosky, 1982), 3) there is development in learning how to take meaning from text (Cochran-Smith, 1984; Heath, 1983; Snow, 1983; Snow & Goldfield, 1983), and 4) these developments can be seen in writing as well as in reading (Bissex, 1980; Clay, 1975; Ferreiro & Teberosky, 1982; Harste, Woodward & Burke, 1984).

Although there is growing agreement about the existence of these prereading skills and their relevance to later reading development, the interrelationships among these factors have not been well charted. Typically studies of the precursors of early

literacy have considered these factors in isolation from each other. Furthermore, it is not clear what the nature of the relationship is between these preschool reading-related abilities and true reading in school-age children. Does each of the various preschool skills contribute some portion of the variance in explaining school reading achievement? Or are all just different measures of one, global, preschool 'reading aptitude'? Do any of the preschool abilities have a prerequisite relationship to school reading? Do they have the same relationship to different aspects of school reading? It may be that learning to recognize letters, to rhyme and segment sounds, to read familiar words, to tell stories, and to discuss picture books all constitute steps toward true reading; alternately, it is possible that none of these preschool skills is prerequisite or even directly related to true reading, but that all appear to have such a relationship because they are typical of middle class children, who for other reasons read better in the elementary grades.

Abilities Supporting Early Literacy Development

It is possible to identify four separate clusters of abilities developed by children as they begin learning to read (i.e., decode single words not known by sight) and write (i.e., organize conventional letters into approximations to conventional spellings or pronunciations of words). These clusters are not mutually exclusive and there might well be causal relationships among them (e.g., knowledge of letter names might increase phonemic awareness). Additionally, relationships among factors might vary

by stage of development of the reader, a finding previously reported by Mason and Dunning (1986).

Sound-symbol correspondence knowledge. Certainly the most common ingredient of early reading programs is an effort to teach children names of letters and correspondences between letters and the sounds they frequently represent. This practice is supported by the finding that knowledge of letter names correlates with early reading ability (Chall, 1967; Ehri, 1979; Ehri & Wilce, in press). Learning of letter names is an early component of phonics instruction and direct instruction on phonics also has frequently been found to result in improved reading achievement (Chall, 1967; Chall, 1982; Mason & Dunning, 1986).

Although phonics instruction has often been found to have beneficial effects, the findings are mixed (e.g., Chall, 1967). Beneficial effects also have been found for programs that encourage reading of familiar texts prior to direct phonics instruction (McCormick & Mason, 1986), for a program that emphasizes whole language experiences and facilitation of language awareness (Taylor, Blum & Logsdon, 1986), and for the Kamehameha reading program which stresses reading comprehension in a culturally sensitive fashion (Tharp, 1982).

Phonemic awareness. Awareness of the phonemic structure of language has long been considered an important precursor to early reading. The argument articulated by Mattingly (1972; revised, 1984) is that, in order to learn to read, children need to segment words into phonemes so they can pair phonemes with graphemes. Considerable evidence has supported the contention that phonemic

awareness is related to reading development. Liberman, Shankweiler, Fisher, and Carter (1974) found that children had great difficulty with phonemic segmentation until near the end of first grade. Others have made similar observations (Gleitman & Rozin, 1977; Liberman & Shankweiler, 1979; Treiman & Baron, 1981; Valtin, 1984). Rhyming tasks also tap children's sensitivity to phonemic structure and five-year-olds' ability to recognize and produce rhymes has been found to correlate with later reading achievement (Jusczyk, 1977; Venezsky, Shiload & Calfee, 1972).

Despite the correlational evidence and the conceptual support for the claim that language awareness is required for learning to read, a causal relationship has not been demonstrated. For example, Bachman (1983) studied early spontaneous readers and found they were no more advanced in the ability to attend to the sound structure of words than nonreaders of the same age. In a radical departure from the position that phonemic segmentation skill is prerequisite to reading, Ehri (1979, 1984) has argued that awareness results from learning to read. She argues that print provides a concrete representation of sound, making it easier to reflect upon language.

Orientation to literacy. Numerous investigators (Bissex, 1980; Ferreiro & Teberosky, 1982; Harste, Woodward & Burke, 1984; Heath, 1983; Scollon & Scollon, 1981; Snow & Ninio, 1986; Taylor, 1983) claim that children reared in literate homes learn much about print and how it works through informal involvement in literacy acts. In a recent statement of this position, Harste et al. (1984) highlight the literacy-related competencies of preschool

children. They claim that young children understand important basic principles needed for becoming literate. For example, they know that text carries personally meaningful information, that it is organized in numerous ways, and that making sense with and from text requires a construction of meaning that includes consideration of the social and physical context of the literacy event.

Specific hypotheses about links between skills acquired before children arrive at school and later success at reading are not advanced by Harste et al. (1984), but such hypotheses can be generated from other research that has examined competences similar to those they report. Research on children's understanding of print has found links between conceptual development and reading. For example, Downing (1984) has claimed that some young children lack the cognitive clarity needed for learning to read. By this he means they are confused about what one does when one reads. Similarly, other research has shown that children at risk for reading failure lack basic concepts such as "word," that are needed for talking about print (Ferreiro & Teberosky, 1982). Clay (1979) also has found that understanding of print concepts is predictive of later reading development. It appears that, as a result of contact with print, children acquire concepts needed for thinking about print and develop an understanding of how print functions.

Decontextualized language ability. Psycholinguistic models of the reading process support the well-established belief that oral language provides the foundation for the development of reading ability (Fowler, 1981; Goodman,1982; Nickerson, 1981; Liberman & Shankweiler, 1979; reviewed by Dickinson, in press). This

hypothesis has been refined recently to the claim that oral language ability can be decomposed into conversational (contextualized) ability versus decontextualized ability (for similar ideas but varied terminology see Bruner, 1975; Calfee & Sutter, 1982; Cummins, 1979; Donaldson, 1978; Scollon & Scollon, 1981; Snow, 1983, in press; Tannen, 1982).

Distinct clusters of language ability have been found that correspond to the two ends of this continuum. Cummins (1983) found no correlation between measures of BICS (basic interpersonal communication skill) and measures of CALP (cognitive academic linguistic potential) in second language learners. Snow and her colleagues (Snow, in press; Davidson, Kline & Snow, in press; Snow, Cancino & Gonzalez, in press) have also found that decontextualized language skills correlate highly across weaker and stronger languages in bilingual children, and they correlate across two different tasks in the same language. Most importantly, they have found limited correlations between skill on tasks requiring decontextualized abilities and those requiring contextualized skill, and strong correlations between oral decontextualized skills and school achievement, but no prediction from conversational skills to school achievement (Snow, Cancino & Gonzalez, in press).

The ability to reconstruct familiar stories that approximate those found in often-read books has been found to develop with age and to correlate with later reading development (Sulzby, 1983). Also, children develop the ability to differentiate their language production strategies depending upon whether they must produce

contextualized or decontextualized texts (Cox & Sulzby, 1982; Snow, in preparation). It also has been suggested that development of decontextualized language ability, including the competence to communicate and understand monologues that convey large amounts of information to unknown and absent audiences, may help children become skillful readers and writers (Snow, 1983). Skill with decontextualized language may be fostered through adult-child conversation and through exposure to books (Snow, 1983; Snow & Ninio, 1986).

Social Class and Early Reading Development

Social class differences in reading achievement have been found repeatedly (e.g., Coleman et al., 1966; National Assessment of Educational Progress, 1985). Social class differences have not been found for contextualized language skills (Wells, 1979, 1981, 1985), but they are apparent in oral language tasks which require decontextualized abilities--e.g., retelling a story, answering open-ended questions, giving explanations--(Bernstein, 1971; Blank, 1975; Blank et. al., 1978; Farran, 1982; Feagans, 1982; Rackstraw & Robinson, 1967; Tough, 1977).

The origins of these differences is not clear. It is not the case that working class children in the United States receive no exposure to print or to literacy practices (Anderson & Stokes, 1984; Miller, Nemoianu & DeJong, 1986; Snow et al., in press). And other research suggests that, in fact, middle and working class children have rather similar abilities to read print found in the environment, and are equally aware of basic distinctions between print and pictures (Goodman, 1986; Harste, Woodward & Burke,

1984). On the other hand, the nature of adult-child interaction around print is affected by social class (Miller et al., 1986; Ninio, 1980) and by culture (Anderson & Stokes, 1984; Heath, 1983). These interactional differences are likely to result in differential training in use of decontextualized language (Snow, 1983; Heath, 1986). Additionally, social class differences have been found in children's concepts of printed language (Ferreiro & Teberosky, 1982).

Finding social class differences for abilities related to school achievement or literacy is never very surprising; it is much more interesting if some of these abilities show no social class differences. We examined children from middle class and working class families on the range of factors associated with early literacy to discover whether we could find a pattern that was characterized by the absence of social class differences on some variables and their presence on others. Variables associated with decontextualized language skill have been hypothesized to show class-linked variation, and it might be anticipated that these differences would persist even in children attending nursery-kindergarten programs precisely because this ability is hard to develop in classroom settings and is not the focus of most preschool curricula. Conversely, in high caliber preschool programs such as those from which we drew subjects for this study, we might expect that the classroom learning had reduced any preexistent social class differences on factors associated with general literacy exposure. Control of sound-symbol correspondences was expected to show class-linked differences because, at this

early point, it reflects the cumulative effects of instruction and home exposure to print and to early reading.

Hypotheses

Varied factors have been claimed to be predictive of later reading ability. We explored the interrelationships among these factors in young children who were just beginning to learn to read. Additionally, we looked for social class differences in development of each of the various factors. We had two primary hypotheses:

1) We anticipated that separate clusters of factors would emerge. We expected correlations among measures of abilities reflecting grasp of sound-symbol correspondence, measures of phonemic awareness, measures of children's understanding of how printed language functions, and measures of decontextualized language ability.
2) Social class differences were anticipated for measures of decontextualized language and grasp of sound-symbol correspondences, but not for measures of abilities focussed on in the kindergarten such as print concepts and general understanding of how books function.

Methods

Subjects

Thirty-three kindergarten children (mean age 5 years 2 months; 16 boys and 17 girls), drawn from two social class groups were tested. Lower S.E.S. children were defined as those whose parents were unemployed, worked in unskilled positions or in clerical or blue collar positions (n = 18). Higher S.E.S. children were those whose parents held professional positions (n = 15). All children

attended one of two different full day kindergarten/day care programs that had an ethnic and economic mix of children and were judged to be of very high quality.

Procedures

Children were tested individually by one or two testers in a separate room of the day care center. Children were tested in three to four sessions of 15 to 20 minutes each spread out over several months' time. All tests except the oral language measures were given between October and February, most between October and December. Oral language tests were done in the late winter, and were finished by early March.

Rhyming. The experimenter showed the children a handpuppet. Half the children were told, "This puppet's name is Nat. Nat only likes words that sound like his name. For example, he likes words like FLAT, SPLAT, and RAT. Nat does not like words like NOT, NEED, or CAR. Can you think of some other words Nat would like?" Children were given 15 seconds to think, and were limited to four responses. All responses were recorded. The experimenter continued, "Now I'm going to say two words, and I want you to pick the one Nat would like, because it sounds like his name. Which one would Nat like?" She presented the children six word pairs one at a time; hat/hate, feet/fat, cut/cat, mat/moat, sat/sand, and bag/bat. Instructions were repeated as necessary, but the words "rhyming" or "rhyme with" were not used. The remaining subjects were introduced to "Ned", with appropriate rhyming pairs being supplied. For the final analysis of this task we used only the number of correct rhymes identified.

Letter Writing. This task was adopted from Harste et al. (1984). Children were asked, "Have you ever gotten a letter or a postcard in the mail? Well, this is a letter for you from (child's teacher). Can you read it to me?" They then were presented an envelope addressed to them that contained a letter from their teacher. The child was allowed time to try to read the letter alone, then the experimenter read it aloud. Children then were given paper and pencil and told, "Now you write a letter back." If the child resisted, the experimenter offered encouragement and suggested topics to write about. When the child seemed finished, the experimenter asked him to draw a picture to go with the letter, then to write his name on it.

Responses were scored for the direction in which children wrote (left-right and up-down), the types of marks produced (only conventional letters, idiosyncratic marks, a combination), the organization of the letters (in word or word-like units, isolated, continuous) and the parts of the letter included (salutation, body, closing).

Spelling. This task was adopted from Morris and Perney (1984). The children were told, "I'm going to say some words. I want you to spell each word the best you can. I know you probably won't know how to spell them the way adults spell them, but just do the best you can." The list included: back, sink, mail, dress, picking, lake, rice, peeked, stamp, light. Children were given as much time between words as required.

Scoring followed the rules used by Morris and Perney (1984). Children were given a score from 1 to 5 for each word depending upon the number of sounds correctly represented (1 point for beginning consonant, 2 points for two consonants, 3 points for consonants and a long vowel or letter-name substition for a short vowel sound, 4 points for correct representation of a short vowel, 5 points for correct spelling).

Alphabet Knowledge. Children were presented a page with all upper and lower case alphabet letters printed on it in random order (from Clay, 1979). Children were shown one line of the page a time and asked to identify each letter. One point was given for each letter identified correctly.

Decoding. After the alphabet knowledge task children were asked to read CVC words presented on 4" x 6" cards. Words presented included: dog, cat, bed, sun, rip, hit, and bag. If the child was completely unable to decode, the experimenter asked him or her to point to a specified letter in the words. Children were given one point for each sound correctly decoded. The pointing responses were not used in the final analysis because they were redundant with the alphabet knowledge task.

Sound Isolation. A task was developed that mimicked the one used previously by Zhurova (1973). The experimenter showed the child a Big Bird doll and asked "What is his name?" If the child did not know, the experimenter supplied it. The experimenter continued, "Is it 'ig ird'? What's wrong with the way I said it?" If necessary, she answered "I left off the first sound. What is the first sound in Big Bird? Listen carefully while I say it. B-b-

ig B-b-ird. Can you hear what the first sound is?" The child's name was used as a second example when children were unable to respond to the Big Bird question. Children who gave the name of the letter were encouraged to make the sound instead.

The children were told that the animals wanted to get across a bridge into their house, but in order to get there they needed to have the children tell Big Bird the first sound in their name. For each animal (dog, cow, monkey, goat, sheep, pig) children were asked, "What is this?" and "What is its first sound?" If the child could not give the first sound, the experimenter asked him to say the name out loud and try to guess it. If the child was still unsuccessful, the experimenter said the name slowly and asked again. Number of correct initial sounds was used as the child's score.

Story Comprehension. The Del Rio (1975) test of story understanding was administered. This task includes six brief stories that were read aloud. Each story is followed by two to four questions regarding explicit and implied story content. One point was given for each correct answer.

Environmental Print. Materials for this task were twelve pictures of commonly known product labels and signs on laminated cards. These were grouped into three categories, print and logo (McDonalds, Sesame Street, Care Bears, and Burger King). Distinctive print without logos (Cabbage Patch Kids, Reese's and Coca-Cola), and familiar words in block print (Jell-o, stop, pizza, Cheerios).

Familiarity was determined by a pilot test that included 22 cards. The best known of these cards from each sub-grouping were included in the present study. Children were shown cards one at a time, and asked what they said and how they knew. Children who could not identify the word were encouraged to guess. One point was given for each word correctly identified.

Picture description. Children were asked to describe pictures under two conditions. One, the contextualized condition, put no special requirements on the description; the experimenter sat next to the child and obviously could also see the picture being described. The other condition required more decontextualized language; the experimenter instructed the child to describe the picture so that someone who had never seen it could draw one that looked just like it from the description. Many different aspects of the children's language use during the picture description task were calculated; for the purposes of the present analysis, only variables that reflected decontextualization (specificity of information) and those that reflected narrativity (the degree to which the child chose to tell a story rather than sticking to straight description) were used. Complete information on the scoring of the variables that contributed to these two scores are given in appendix A.

Vocabulary, Print Concepts. In addition to the tests constructed for this study, children also were given the Peabody Picture Vocabulary Test, and Clay's (1979) Concepts of Print test. Both were scored in standard ways. The Clay Concepts of Print task was broken into three subscores: two were considered to be relevant

to knowledge about literacy, whereas the third was a measure of print decoding ability.

Definitions. Each child was asked to tell the meaning of 10 nouns from the WISC-R. Instructions used followed those of the WISC-R, but the scoring of the responses relied on a scoring scheme developed in previous work (see Davidson, Kline & Snow, in press; Snow, Gonzalez & Cancino, in press; full coding scheme given in appendix B). The scoring scheme first categorizes responses into formal or informal definitions; formal definitions contain at least a copula and some sort of superordinate (e.g., a diamond is something..., a thief is a person who...). The appropriateness of the superordinate chosen, the complexity of the syntax used in the limiting clause following the superordinate, and the specificity of the definitional features mentioned all contribute to a score of formal definitional quality per word. If a response does not qualify as a formal definition, points are given for each correct bit of information offered about the word, to produce a scored of informal definitinal quality. In addition, each definitional response is scored for global communicative adequacy on a four point scale, and the use of conversational features (questions, gestures, appeals to the tester, etc.) is noted and calculated per word.

Reduction of Variables: Prereading

A first step in preparing the results for analysis was to compute summary variables for each of the major hypothesized components of preschool literacy: phonemic awareness, print decoding, print production, knowledge of literacy forms, and

various aspects of contextualized and decontextualized oral language skill. Scores on individual tests were inspected, and intercorrelations among all the tests scrutinized in order to ensure that the theoretically driven composite variables were created in a way that did no violence to the characteristics of the component variables, that provided the best possible distributions of scores, and that made good empirical sense. The pattern of correlations with some of the tests intended to reflect one or another of the components led to discarding them entirely. The composite variables were in all cases computed by taking a simple arithmetic mean of the component scores.

Phonemic awareness. Sound isolation and rhyming contributed to the composite variable Phonemic Awareness. Sound isolation and rhyming correlated .93 and .49 with the Phonemic Awareness composite score respectively.

Print decoding. Scores on the decoding task, on items 12 to 22 in the Clay test, and on the test of alphabetic knowledge were combined to produce the Print Decoding score. All the interrelationships among subtests and between subtests and the total score were high and positive ($r = .95, .62$, and $.79$ for subtest correlations to Print Decoding). Environmental Print was originally intended to be a part of Print Decoding, but was kept as a separate variable for two reasons: a) it was only administered to 22 subjects, and thus reduced the n on Print Decoding unacceptably, and b) its pattern of correlation with the other components was weaker than desired.

Print production. Print Production was an unweighted mean of three subscores: the Symbol Type score (conventional,idiosyncratic) on the letter-writing task, the Organization score (word units, isolated letters, continuous letters) on the letter-writing task, and the total spelling score. These all correlated significantly positively with one another, and correlated .54, .91, and .56 respectively with the Print Production score.

Literacy. A composite literacy score was created by combining the scores for the first and last parts of the Clay test, and the Directionality and the Parts subscores of the letter-writing test. The Clay subscores correlated .96 and .80 with the Literacy score, and the letter-writing scores correlated .33 and .56 respectively.

Reduction of Variables: Oral Language

Oral language was analyzed to reflect a number of different dimensions of skill in using language. Two composite oral language measures were derived from the picture description task. Each was calculated separately for the contextualized and the decontextualized condition, but they operated very similarly and so for simplicity's sake only the results for the decontextualized scores are reported here. Four measures from the definitions task reflect four theoretically independent abilities tapped in this task.

Decontextualization. Four measures contributed to the composite measure of decontextualized language use obtained in the decontextualized picture description task: the percent of self-corrections that were communicative clarifications; the number per t-unit of locative expressions; the percent of total words that

would be left in an 'edited' version of the description; and the *percent of noun phrases* that were lexical.

Narrativity. A number of aspects of the children's language use in the decontextualized picture description task seemed to relate to a tendency to turn the description into a story. These measures were compiled into the Narrativity composite. They included: child use of formal openings ('once upon a time...'), closings ('the end' or 'they lived happily ever after'), titles, and adherence to a plot line; child introduction of extrapictorial elements, such as names for characters, attribution of intention to characters, identification of characters' internal states, use of dialogue, etc.; child use of non-present tense verbs (necessary if temporal sequencing is made explicit); child use of unusual conjunctions, necessary to make causal and temporal relations among narrative events explicit; number of verbs per t-unit, which is greater if relations among events are made explicit in subordinate clauses; and use of adjectives, which was found to correlate with the other narrativity measures.

Formal definitional quality. All formal definitions were given a summary score that reflected the quality of the various component parts: superordinate, relative clause, definitional features offered. The average quality score per word was used as a measure of children's decontextualization ability.

Informal definitional quality. All informal definitions were scored on the amount and quality of the information offered about the meaning of the word. The average summed word score reflected the child's ability to convey information orally.

Conversational features. Children's use of conversational features (questions to the adult, gestures, forms like 'you know', etc.) during the definitions task was tabulated; this measure has been shown in other research to relate to conversational skill across a variety of tasks.

Communicative adequacy. A global rating of the communicative adequacy of the child's definition, on a four-point scale, was given. In addition to the above composite variables, Environmental Print and Story Understanding scores were included in all analyses.

Results

Relationships among the Factors

As can be seen from Table 1, Phonemic Awareness, Print Decoding, Print Production, and Literacy all interrelate positively, rather highly, and significantly, but have generally low or negative correlations with the oral language composites (because of the multiplicity of measures, we have set .01 as the appropriate alpha for both the correlational and other analyses). Formal Definitional Quality is the exception among the oral language measures; it shows positive and high correlations to the prereading composites. The Literacy composite and the Story Understanding task stand out for the degree to which they relate positively to all the other prereading measures except for

Environmental Print. Environmental Print generally shows only weak relationships to the other measures of early reading and writing ability, suggesting that it might be a rather poor predictor of later school reading achievement.

Within the various oral language measures, Formal Definitional Quality has the expected high negative relationship to Informal Definitional Quality. While work with older children has shown that Formal Definitional Quality relates to measures of decontextualization in the picture description task (Davidson, Kline & Snow, in press), no such relationship was replicated here.

The results from the correlational analysis suggest that preschool readiness for reading may include many different abilities which are, however, highly related to one another--print skills, phonemic analysis, literate performance more generally, story comprehension, and some specific oral language skills. The correlations within the 'prereading cluster' may, of course, be somewhat specific to populations such as the one we studied, which have attended kindergartens in which all the component skills--decoding, writing, phonemic analysis, listening to stories, talking about words, and practice with various uses of literacy--are promoted. Alternately, it may be that these various skills are truly interdependent, in the sense that getting better at one helps performance in the others. For example, phonemic awareness may derive partly from literacy-promoting experiences such as being read to, and may in turn contribute to skill at decoding and writing. Alternately, attempts at reading or writing may help children to perform phonemic analyses, to inquire more deeply into

word meaning, to become more interested in stories, and to discover the uses of literacy. A longitudinal analysis of the development of these component skills would be necessary to determine whether these various skills are causally or only correlationally related.

Social Class Differences

The existence of social class differnces was tested using general linear models ANOVA's, with class and gender as the classification variables. Gender had no significant main effect for any of the dependent measures. Accordingly, results reported here are for the effects of class controlling for gender.

As can be seen from Table 2, the middle class group scored significantly higher on all the 'prereading' composite scores. The differences were not just significant, but also sizable, suggesting that attendance at high quality nursery/kindergarten classes was insufficient to equalize the skills of the two social class groups. Environmental Print, a task that was seen above to relate somewhat less strongly and centrally to the 'prereading cluster', also showed a nonsignificant social class difference, though the middle class children did score higher.

As could be expected given its close association with the 'prereading cluster', Formal Definitional Quality also showed large and significant social class differences, with the middle class children giving formal definitions of higher quality. Informal Definitional Quality showed the reciprocal difference, with working class children scoring significantly higher. It is important to note that there was no difference between the social class groups on the Communicative Adequacy of their definitions, nor on use of

Conversational Features. Contrary to expectation, there were no social class differences in performance on the Picture Description task.

An alternative way of seeking social class differences is to consider that the interrelationships among the skills may be different for the different social class groups. To examine that possibility, we repeated the correlational analysis for the two groups separately. This analysis was primarily exploratory, since performing the correlations separately left us with groups of only 15 and 18 subjects and even smaller n's for tasks not administered to all subjects. Two major sets of differences were found: Formal Definitional Quality showed much stonger positive relationships to Print Decoding, Story Understanding, Decontextualization, and Age for the working class group and the interrelationships among the definitions task scores were much stronger for the middle class group. In general, though, the correlation matrices were rather similar for both social class groups, indicating that the pattern of relationships we found were characteristic of both groups.

While the social class effects for all the measures in the 'prereading cluster' were large as well as significant, the social class difference on our measure of verbal intelligence, the PPVT, was not significant. Both groups scored very high on the PPVT (the mean score for the working class group was the 78th percentile and for the middle class group the 89th percentile). PPVT did correlate with many of the component variables and with two of the prereading composite variables as well as with Story Understanding, but not significantly with any of the oral language composite

variables (the only correlations that came close to significance was with Communicative Adequacy). Social class differences in PPVT clearly did not explain our findings of social class differences in these other variables, however; the largest social class difference was found for the definition scores, which were not significantly correlated with PPVT.

Developmental Effects

The children tested were drawn from a group which was fairly homogeneous with regard to age (mean = 62.1, SD = 5.87). Accordingly, it would be surprising if we found any large effect of age on performance. In fact, correlations between the prereading composites and age were positive but low, and those between the oral language variables and age were essentially zero; the only significant correlation with age was found for Story Understanding (see Table 1). While the skills we are analyzing here undoubtedly develop with age, they are clearly also highly dependent on experience. Davidson, Kline and Snow (in press) found no significant correlation between performance on the definitions task and age, in children ranging from 6 to 11 years. That finding, like these, makes clear that effects of education and experience can swamp those of maturation, and reduce the influence of age on performance.

Discussion

Summary of Findings

Our research continues the recent attempt to identify the capacities that preschool children develop as they become literate members of society. Researchers on emergent literacy have claimed

that skills related to later reading can be identified at an early age (reviewed by Teale & Sulzby, 1986). The fact that kindergarten children were able to engage our tasks involving print in an organized manner indicates that they clearly had some capacity to read and write. The success on oral language tasks posited to be related to early reading further supports this conclusions.

Our data support a second assumption of students of emergent literacy, that reading, writing, and some oral language variables are interrelated (Dickinson, in press; Teale & Sulzby, 1986). With the exception of the Environmental Print test, we found all the measures of early reading and writing to be strongly interrelated. Relationships were equally strong between measures involving print (Print Production, Decoding) and those that required no print-specific knowledge (Story Understanding, Phonemic Awareness, PPVT).

We also examined relationships among oral language tasks that have been shown to reveal ability with decontextualized language in older children (Davidson, Kline & Snow, in press; Snow, Cancino & Gonzalez, in press; Snow, in preparation). We found that measures of decontextualized language ability previously shown to be related across the word definition task and the picture descripton task in elementary school-aged children (Davidson, Kline & Snow, in press), were not related in preschool children. This finding raises the possibility that the organization of decontextualized language skills changes with age. We also found strong relationships between the measures of children's Formal Definitions and three of the prereading measures (Print Decoding, Print Production,

Literacy), supporting the claim that decontextualized language ability is related to early reading (Snow, 1983).

Our examination of class-related differences resulted in some surprises. Contrary to our expectations, strong social class differences did appear for four of our prereading measures, Literacy, Print Decoding, Print Production and Story Understanding, and was marginally significance for Phonemic Awareness ($p = .03$). We had anticipated that participation in strong preschool and kindergarten programs would tend to eliminate social class differences in children's knowledge of print.

As anticipated we also found dramatic class-related language differences on the definitions task. Middle class children scored twice as high as working class children on quality of formal definitions, while working class children's scores on the quality of informal definitions were three times higher than those of working class children.

Theoretical Implications

Interrelationships among abilities. In a summary overview of recent studies of emergent literacy, Goodman (1986) identifies several 'roots of early literacy', some of which correspond to skills that we assessed. The most basic ability she identifies is awareness of print in context, the ability to make sense of print to which children naturally are exposed. This competence develops early and is found in children from racially, linguistically, geographically and ethnically diverse backgrounds. Our Environmental Print task tested contextualized print ability. We too found no social class differences for this variable. However,

we also found that scores on this task did not correlate highly with the more advanced literate skills tapped by the Decoding and Print Production tasks. Apparently the ability to recognize signs and labels develops in all young children in literate environments, but does not necessarily lead to skill in approaching print in a more analytical or decontextualized manner (see also Masonheimer, Drum & Ehri, in press).

A second root of literacy discussed by Goodman (1986) is print awareness in connected discourse which covers skills such as understanding of how books work (e.g., how to hold them, print is what is read) and knowledge of print-related terms such as "read." This root corresponds well to our Literacy composite, which includes some of the same measures discussed by Goodman. We found this composite to be more strongly related to other literacy abilities than any other composite score. Apparently children who have begun to understand generally how print functions usually proceed to develop rudimentary decoding and writing abilities.

A third aspect of developing literate abilities is growth of metalinguistic abilities. We did not probe metalinguistic knowledge broadly, preferring to focus on Phonemic Awareness since it has the most direct relation to reading. As predicted, Phonemic Awareness does relate to other early reading skills. It does not correlate significantly to Environmental Print, further suggesting that sensitivity to signs and labels does not necessarily require assuming an analytic approach to print.

The oral language results extend our knowledge of the capacities that develop as children become literate. The strong relationship between the Formal Definitions score and the early literacy components suggests further support for the claim that, as children become literate, they become more able to distance themselves from language and treat it as an object. While some discourse skills are differentially developed in different homes (Heath, 1986), the capacity to define words most likely does not develop in preschool children through direct practice. Rather, the inclination to reflect on language and provide relatively complete definitions that correspond to the form used by literate adults reveals a growing ability to reflect on language, to analyze one's own knowledge of word meanings, and to control the conventions of formal language. It should be noted that differences in definitional skill cannot be explained as a result of vocabulary development, since Formal Definition scores did not correlate with PPVT scores or with the Communicative Adequacy score, both indicators of the child's knowledge of word meanings.

Another oral language result of special interest was the finding of strong correlations between the story understanding task and the literacy composites. Previous work on early literacy has paid little attention to oral comprehension skills (for an exception see Feagans, 1982; Farran, 1982), though it has been noted that children receive differential training in how to interpret text (Dickinson & Keebler, 1986; Heath, 1983; Teale & Martinez, 1986). The story understanding task required children to recall factual details and to make some minimal inferences.

Ability to assume the stance to text required to respond to such questions appears to develop more rapidly in children who also learn to read and write relatively early.

Our oral language results complement existing data that indicate that special oral language abilities develop as children become literate. But contrary to expectations, we found that our two measures of decontextualized oral language skill showed different patterns of correlation with our prereading composites. Previous work with older children (Davidson, Kline & Snow, in press; Snow, in preparation) found similar profiles on the definitions and picture description tasks. The finding of different patterns among younger children suggests that, as children get older, they may consolidate decontextualized language skills, and extend them to a broader range of tasks.

Social class differences. Considerable evidence (Snow et. al., in press; Teale, 1986) suggests that there is great variation in the exposure to literacy provided by homes classified as "working class." Nevertheless, for the purpose of educational policy development and research, it is not always possible to produce the detailed descriptions of home background that are needed to determine what literacy-related experiences children are having at home. It is therefore of interest to learn how early literacy competencies are related to more easily obtained home background variables such as social class. It is significant that, despite the variation which we assume exists in the homes of our children within both social class groups, class-related differences did appear on all the prereading measures which required careful

attention to print (Literacy, Print Decoding, Print Production). The lack of social class difference on the Environmental Print task indicates that all children have some exposure to and awareness of print. In addition to this basic exposure, middle class homes also provide children with experiences that enable them to interpret unfamiliar print and to produce messages that approximate conventional forms.

Only a weak relationship between class and Phonemic Awareness appeared. This may be because nearly all children did quite well on both the rhyming and the sound isolation tasks. Although we did find stong correlations between the Decoding and Print Production measures and Phonemic Awareness, harder phonemic awareness tasks (e.g., identification of medial sounds) might have favored better readers and writers even more, and as a result, have shown stronger class-related differences. Alternatively, it may simply be the case that all homes or strong preschool programs provide children of normal language abilities with sufficient phonemic awareness to enable them to begin attempts at early reading and writing.

The lack of social class differences on all but two oral language variables (including PPVT) indicates that all children had roughly equivalent oral language abilities, echoing the finding of Wells (1979, 1985). Social class differences did appear on two measures of the ability to provide formal definitions and on the Story Understanding task. These are also the only oral language tasks that are significantly related to the prereading cluster. This finding suggests that although all children have similar oral language capacities, homes that are preparing children for literacy

most effectively are also helping children develop specialized discourse skills that they can employ in school and school-like settings.

Instructional Implications

Our data indicate that educational programs for young children should strive to support a broad range of early literacy skills, because these skills are interrelated and are likely to be mutually supportive. Growing ability to interpret print is closely tied to the ability to produce it. Qualitative aspects of children's responses to different tasks also support the practice of embedding experiences that foster literacy in functional tasks. Our decoding and production tasks included school-like tasks (spelling test, decoding of isolated words) and more naturalistic tasks (letter writing, book reading, environmental print). Both types of tasks revealed similar paths of development, but our young subjects found the test-like tasks to be highly stressful. In contrast, they generally enjoyed the more naturalistic tasks. Regular use of such test-like tasks could have a devastating effect on children's enjoyment of print and, ultimately, on their willingness to experiment with it and use it for their own purpses.

Our data also support the value of preschool curricula that work to strengthen oral language skills. The capacity to reflect on language at the phonemic level as well as the discourse level (e.g., in giving formal definitions) is an important correlate of early literacy. This finding supports the value of programs such as that of Taylor, Blum and Logsdon (1986) that work to foster emergent reading and writing as well as language awareness.

The Story Understanding results also have some curricular implications. They indicate that children may benefit from opportunities to attend carefully to the literal meaning of text. Research on story reading styles (Dickinson & Keebler, 1986; Teale & Martinez, 1986) indicates that teachers can foster this capacity as they read to children and that teachers vary greatly in the extent to which they emphasize text comprehension in their discussions of stories.

Future Research

While it is helpful to begin to be able to describe the patterning of prereading and oral language abilities at one age, longitudinal work is still necessary. Such work would help determine whether the same close connections among literacy variables are carried over into the school years, as reading becomes a more challenging task. Even more importantly, longitudinal work would reveal how early abilities are related to the full array of reading abilities -- comprehension as well as decoding and word attack skills. Ideally, such longitudinal work would also describe home experiences hypothesized to be related to early literacy. Such work would provide guidance to parents and educators interested in creating environments conducive to the development of early literacy and supportive of later academic achievement. It would also help researchers understand the cognitive and linguistic demands made upon the child by the reading and writing tasks of increasing difficulty presented in the later elementary and higher grades.

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Table 1

Intercorrelations Among Measures

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 - Phonemic Awareness	1.0	.45*	.56**	.56**	.23	.54**	.11	-.09	.29	.05	.12	.24	.10	.48*
2 - Print Decoding		1.0	.57**	.69**	.53*	.49*	.29	.09	.49**	-.32	.26	-.22	.29	.41
3 - Print Production			1.0	.75**	.46	.55*	.12	-.28	.44*	-.37	-.01	.07	.21	.40
4 - Literacy				1.0	.46	.70**	.07	-.07	.51**	-.30	.13	.07	.24	.60**
5 - Environmental Print					1.0	.09	.30	.12	.27	-.15	-.07	.07	-.07	.24
6 - Story Understanding						1.0	-.06	-.01	.44	-.24	.25	.37	.52*	.65**
7 - Decontext.							1.0	.14	.11	-.16	.24	-.01	.26	.01
8 - Narrativity								1.0	-.14	.02	.04	.01	.08	.18
9 - Formal Def.									1.0	-.79**	.66**	.21	-.10	.20
10 - Informal Def.										1.0	-.56**	-.05	-.17	.15
11 - Conv. Features											1.0	.30	.03	.02
12 - Comm. Adeq.												1.0	-.25	.41
13 - Age													1.0	.13
14 - PPVT														1.0

* $p < .01$

** $p < .002$

Table 2. Comparisons of Component Scores of Working Class and Middle Class Kindergartners' Performances on Print and Language Tasks.

Components	Working Class	Middle Class	p
Prereading Tasks			
Print Production	5.07	7.56	.0001
Print Decoding	19.27	28.29	.008
Literacy	9.81	14.96	.0001
Environmental Print	14.58	17.50	NS
Phonemic Awareness	6.25	7.53	.03
Story Understanding	6.08	8.70	.004
Picture Description Task			
Decontextualization	2.16	2.31	NS
Narrativity	3.20	2.63	NS
Word Definition Task			
Formal Definitional Quality	2.26	5.53	.001
Informal Definitional Quality	.91	.31	.01
Conversational Features	1.45	1.77	NS
Communicative Adequacy	.62	.64	NS

Coding of Narrative Picture Descriptions

Title	1 if there is some title indicated, 0 if not.
Opening	2 if there is some narrative opening (once upon a time, one day in Africa), 1 if narrative begins "there is/there are", 0 if there's no formal opening at all.
"This picture"	1 if any explicit reference is made, e.g. In this picture" "This is a picture of..." "I am looking at a picture..." 0 if not.
Closing	1 if some conventional closing is suggested ("And they all lived happily ever after" "And that was that"), 0 if not.
"The End"	1 if "the end" or "that is it" is said, 0 if not.
Narrativity Rating	This is a measure of interpretation of the task: 0= no indication of any event or activity, straight description. 1= one or two events are suggested or given, but it's basically a descriptive essay/speech. 2= The description and events mix. 3= Basically a linear narrative, though it's incomplete or inadequate. 4= Description is subordinate to the narrative. All sentences are integrated into a basically narrative structure.
Revisions	Number of false starts, self corrections, etc.
# Communicative	Revision of word choice to reduce ambiquity (e.g. On the beach) or increase explicitness, correctness or clarity of meaning ("she had brown...no blond hair"), insert omitted words ("the water... the blue water"), etc. Count number.

# T-Units	A T-Unit is the smallest unit of syntactically independent speech, i.e. a subject-predicate structure with all associated subordinate clauses. Main clauses linked by "and" are separated, while those linked by "but" and "because" are usually left together.
Naming Characters	1 if characters are given names, 0 if they aren't.
Extra Pictorial Elements	The number of clauses or events described that go beyond the picture, e.g. "Later they will eat dinner" "Papa Pig just left for Pig Town" "If they're not careful they may get sunburned".
References to Characters' Internal States	The number of phrases or lexical items that refer to the characters' inner experiences or points of view, e.g.:"She is having fun" "She wants to play, too" "Marie is hot".
Conversational Features	I-intrusions (author's voice), ("I forgot to say that...") "You can see that..." "Oh yeah" "By the way..." Count number.
Specific Locatives	Number of phrases that clarify location: "Behind the sink..." "The mother is next to the cabinet..." "To her right is..."
Dialog	1 if author introduces dialog into text, 0 if s/he does not.

Clarificatory Markers	Number of clauses or phrases which clarify or expand on a referent. "The girl with the hat" "The boy with the fishing rod". "The pig behind her..." counts both as a locative and as a clarificatory marker.
Specify Characters as Animals	1 if author explicitly states that the characters are animals, 0 if s/he does not.
Total Words	Total Number of Words
Edited Words	Number of words that would be in an edited version of the description after crossing out errors, false starts, etc.
% of Edited Words	# Edited words/ Total Words
Mean T-Unit Length	# T-Units/# Words
Verbs/T-Unit	# Verbs/#T-Units
% Pres. Verbs	# Present Tense Verbs/Total Verbs
NPs/T-Unit	# NPs/# T-Units. Any pronoun, noun or deverbal noun can get counted as an NP. "Two of the girls" is two NPs, as is "Lots of sand."
% Lexical	#Lexical NPs/Total NPs. Lexical NPs are all those which are not pronouns (She, he, this, these) or numbers ("One of them" contains no lexical NPs, but two NPs.
Mean Degree of T-Unit	Degree is the number of T-Units one needs to go back and locate any particular referent in the current T-Unit. It is the most recent instance of reference, and it is not necessarily lexical.

If more than one referent is intratextual, the T-Unit degree is the highest possible.

Mean Degree of T-Unit is the total of degree scores divided by the number of T-Units.

Example of Degree Coding

Degree	
0	Five children are playing on the beach.
0	It is a hot day.
2	One of the kids is digging in sand.
1	Another one is wearing a hat.
1	Her hat is very pretty.
5	The beach is sandy with bits of grass.
6	The kid with the hat is playing with a blond girl.

Adjs/Words — Number of adjectives/Total number of words

(Note: "Five pigs" counts as one adjective; "Baby pigs" also is one adjective.

Unusual Conjunctions — Number of clausal conjunctions excluding "and" and "and then." (But, because, when, while etc.)

Unusual conjunctions divided by total number of words.

Appendix B

Coding of Noun Definitions

Unit to be coded: all utterances, whether one turn or more, relevant to a given word.

The definition is coded as falling into one of the three, mutually exclusive categories. Any items present within the category under which it is scored are also scored.

A. Synonym alone

B. Formal definition: score only if 1, 2, or 3 below is present.

1. Syntax: score on formal features only

   0 = no relevant definitional syntax

   1 = x is (a) y.

   2 = x is (a) y that (incomplete or absent relative clause)

   3 = x is (a) y (reduced relative)

   4 = x is a y (full relative clause)

2. Superordinate term: scored semantically

   0 = no superordinate

   1 = thing, true - very general

   2 = adj and thing, something, someone, somebody

   3 = more specific term but at too high or low a level of generality

   4 = the best superordinate

3. Synonym: if used <u>in addition</u> to formal definitional features

   0 = none given

   1 = vague or incorrect

   2 = correct

4. Relative clause: score on semantic content

   0 = none

   1 = incorrect, or correct but very limited

   2 = helpful and correct, but not limiting

   3 = properly defines correct subset

5. Descriptive features: score number given that are correct

6. Examples: score number correct

7. Use: Score for statement of purpose or use

   0 = none

   1 = vague or limited

   2 = correct

8. Comparison (like an x but/except y)

   0 = none

   1 = partial

   2 = complete

C. Approximation or Circumlocution: Score if Neither A nor B is appropriate

1. Descriptive features: score number correct

2. Examples: score number correct

3. Use:

   0 = none

   1 = vague or limited

   2 = correct

4. Comparison:

   0 = none

   1 = partial

   2 = complete

5. Synonym

D. Communicative Adequacy: Score definition globally for its adequacy in providing the information needed to identify the object/person in question

   0 = no chance to identify the target given this definition

   1 = if the child and the culture were familiar one might guess the target

   2 = limited but not adequate

   3 = probably adequate

   4 = perfectly adequate and complete

E. Communicative Strategies: Note also how often each of the following devices is used:

1. Gesture, clarificatory, point or demonstration
2. Language switch
3. Uptake checks (e.g., you know? see?)
4. Appeals to authority (e.g., how do you call a this?)
5. Linguistic filler (e.g., and so on)